

Prüfbericht-Nr.: <i>Test report no.:</i>	CN22U7V0 002	Auftrags-Nr.: <i>Order no.:</i>	168372209	Seite 1 von 17 <i>Page 1 of 17</i>	
Kunden-Referenz-Nr.: <i>Client reference no.:</i>	N/A	Auftragsdatum: <i>Order date:</i>	2022-05-13		
Auftraggeber: <i>Client:</i>	Xiamen R&T Plumbing Technology Co., Ltd. No.18, HouXiang Road, HaiCang District, Xiamen, 361028, China				
Prüfgegenstand: <i>Test item:</i>	Intelligent Toilet				
Bezeichnung / Typ-Nr.: <i>Identification / Type no.:</i>	V7232-3, V7232-8, V7282-3, V7282-8 (Trademark: R&T)				
Auftrags-Inhalt: <i>Order content:</i>	Test Report				
Prüfgrundlage: <i>Test specification:</i>	FCC CFR Title 47, Part 15, Subpart C, Section 15.249				
Wareneingangsdatum: <i>Date of sample receipt:</i>	2022-05-16	Please refer to Photo Document			
Prüfmuster-Nr.: <i>Test sample no.:</i>	A003260747				
Prüfzeitraum: <i>Testing period:</i>	2022-06-10 – 2022-06-15				
Ort der Prüfung: <i>Place of testing:</i>	MRT Technology (Suzhou) Co., Ltd.				
Prüflaboratorium: <i>Testing laboratory:</i>	TÜV Rheinland (Shenzhen) Co., Ltd.				
Prüfergebnis*: <i>Test result*:</i>	Pass				
geprüft von: <i>tested by:</i>			genehmigt von: <i>authorized by:</i>		
Datum: <i>Date:</i>	2022-07-15 Signed by: Chris Chen		Ausstellungsdatum: <i>Issue date:</i>	2022-07-15 Signed by: Lin Lin	
Stellung / Position:	Section Manager		Stellung / Position:	Reviewer	
Sonstiges / Other:	FCC ID: 2AW23-V7232V7282				
Zustand des Prüfgegenstandes bei Anlieferung: <i>Condition of the test item at delivery:</i>			Prüfmuster vollständig und unbeschädigt <i>Test item complete and undamaged</i>		
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet * Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specification(s) F(ail) = failed a.m. test specification(s) N/A = not applicable N/T = not tested					
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. <i>This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.</i>					

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 FIELD STRENGTH OF FUNDAMENTAL AND HARMONICS

RESULT: Pass

5.1.3 20dB AND 99% BANDWIDTH

RESULT: Pass

5.1.4 BAND EDGE

RESULT: Pass

5.1.5 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

Appendix B: Test Results of FCC Part 15C

2 Test Sites

2.1 Test Facilities

MRT Technology (Suzhou) Co., Ltd.

D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

A2LA accreditation certification number: 3628.01

The tests at the test sites have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Instrument Name	Manufacturer	Model No.	Asset No.	Cali. Interval	Cal. Due Date
Waveguide Harmonic Mixer	Keysight	M1970V	MRTSUE06271	N/A	N/A
Waveguide Harmonic Mixer	Keysight	M1970W	MRTSUE06272	N/A	N/A
mmWave Antenna	MI-WWAVE	261U-25/383	MRTSUE06273	N/A	N/A
Signal Analyzer	Keysight	N9030B	MRTSUE06395	1 year	2022-08-08
mmWave Antenna	A-INFO	LB-15-25-A	MRTSUE06409	N/A	N/A
mmWave Antenna	A-INFO	LB-10-25-A	MRTSUE06410	N/A	N/A
Preamplifier	Schwarzbeck	BBV 9721	MRTSUE06121	1 year	2023-06-08
EMI Test Receiver	R&S	ESR3	MRTSUE06185	1 year	2022-12-29
Horn Antenna	Schwarzbeck	BBHA 9170	MRTSUE06598	1 year	2022-11-09
Horn Antenna	R&S	HF907	MRTSUE06611	1 year	2022-09-12
Thermohygrometer	testo	608-H1	MRTSUE06619	1 year	2022-11-02
Thermohygrometer	testo	608-H1	MRTSUE06622	1 year	2022-11-28
Preamplifier	EMCI	EMC012645SE	MRTSUE06642	1 year	2023-01-13
TRILOG Antenna	Schwarzbeck	VULB 9168	MRTSUE06646	1 year	2022-08-26
Anechoic Chamber	RIKEN	SIP-AC3	MRTSUE06782	1 year	2022-12-23
Loop Antenna	Schwarzbeck	FMZB 1519 B	MRTSUE06937	1 year	2023-03-14

Conducted Emission on AC Mains

Instrument	Manufacturer	Type No.	Cali. Interval	Cal. Due Date
Two-Line V-Network	R&S	ENV216	1 year	2022-06-08
Shielding Room	MIX-BEP	WZ-SR2	5 years	2026-12-20
Thermohygrometer	testo	608-H1	1 year	2022-06-28
EMI Test Receiver	R&S	ESR3	1 year	2022-11-01
EMI Test Receiver	R&S	ESR7	1 year	2022-12-29

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions measurements as below table.

Parameter	Uncertainty
Radio frequency	$\pm 1 \times 10^{-7}$
RF power (conducted)	$\pm 2,5$ dB
Radiated emission of transmitter, valid to 26,5 GHz	± 6 dB
Radiated emission of transmitter, valid between 26,5 GHz and 100 GHz	± 8 dB
Radiated emission of receiver, valid to 26,5 GHz	± 6 dB
Radiated emission of receiver, valid between 26,5 GHz and 100 GHz	± 8 dB
Conducted Emission (9kHz~150kHz)	3.74dB
Conducted Emission (150kHz~30MHz)	3.44dB
Temperature	± 1 °C
Humidity	± 5 %
Voltage (dc)	± 1 %
Voltage (ac, < 10 kHz)	$\pm 2\%$
NOTE: For radiated emissions above 26,5 GHz it may not be possible to achieve measurement uncertainties complying with the levels specified in this table. In these cases alone it is acceptable to employ the alternative interpretation procedure specified in clause 5.9.1.	

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A & B of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The MRT Technology (Suzhou) Co., Ltd. Test facility located at D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUTs are **Intelligent Toilet**, which contains a Remote Control and a Toilet Seat. The Toilet Seat supports General 2.4GHz receiver and 24GHz wireless technology, the Remote Control supports General 2.4GHz transmitter wireless technology.

The toilet have two type buttons, one is Knob button(Model V7232-3, V7232-8), another is Key button(Model V7282-3, V7282-8), all others are same. Test model is Model V7232-3. The difference of -3 & -8 is the difference of external water tank.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment:	Intelligent Toilet
Type Designation:	V7232-3, V7232-8, V7282-3, V7282-8
Trademark:	R&T
FCC ID:	2AW23-V7232V7282
Operating Voltage:	AC 110-120V, 50/60Hz for Toilet DC 3 V(2pcs AAA) battery for Remote Control
Testing Voltage:	AC 120V, 60Hz for Toilet
Operating Temperature Range:	5 °C ~ 40 °C
Technical Specification of 24GHz (for Toilet)	
Frequency Range:	24.00 - 24.25 GHz
Type of Modulation:	FMCW
Antenna Type:	PCB Layout Antenna
Antenna Gain:	14.50 dBi

3.3 Independent Operation Modes

The basic operation modes are:

- A. 24GHz transmitting mode (Toilet only)
- B. On, 24GHz connecting mode
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- | | |
|-------------------------|------------------------------|
| - Application Form | - ID Label and Location Info |
| - Operation Description | - Block Diagram |
| - Schematics | - PCB Layout |
| - Parts List | |

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All tests were performed according to the procedures in ANSI C63.10: 2013.

Table 3: Test environments

Environment Parameter	Values During Tests		
	Temperature	Voltage	Relative Humidity
NTNV	25°C±2°C	120Vac	Ambient

Table 4: Test channel and frequency

Mode	Test Channels (GHz)	Remark
Transmitting	24.00 to 24.25 GHz	--

4.3 Special Accessories and Auxiliary Equipment

Table 5: Auxiliary Equipment Used during Test

Description	Manufacturer	Model	S/N
--	--	--	--

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

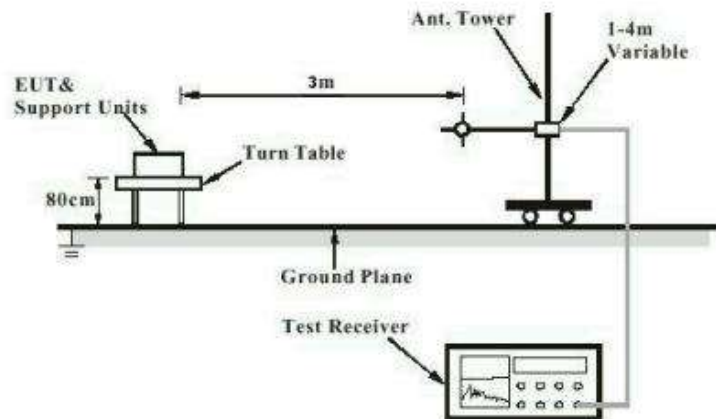


Diagram of Measurement Configuration for Radiation Test (1-40GHz)

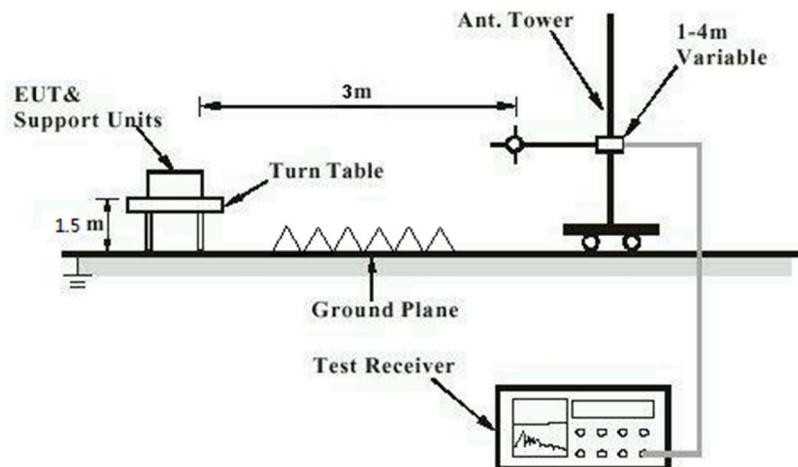


Diagram of Measurement Configuration for Radiation Test (40-100GHz)

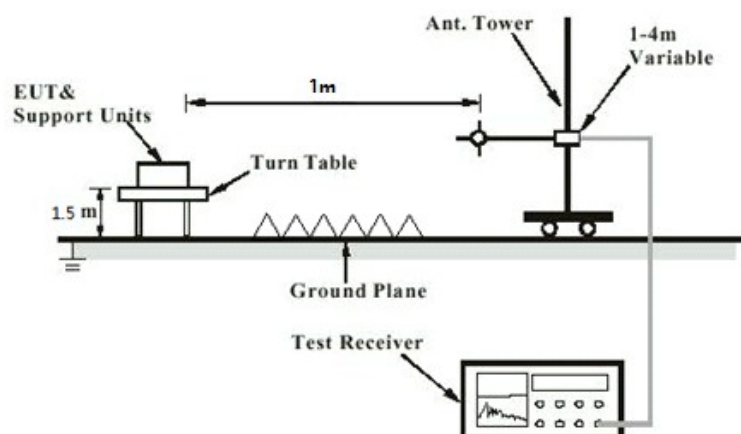


Diagram of Measurement Configuration for Conducted Transmitter Measurement

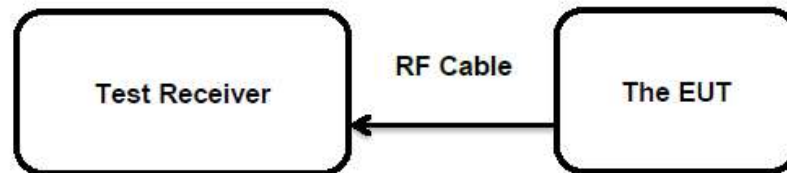
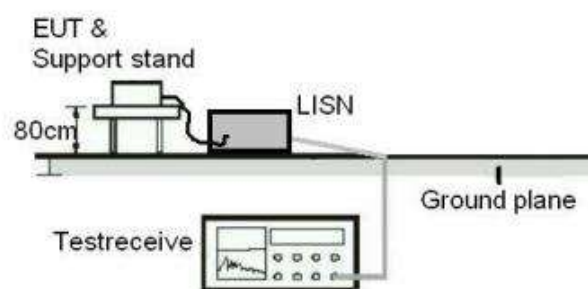


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.203

According to the manufacturer declared, the EUT has a PCB Layout antenna, the gain of antenna is 14.50 dBi, which that permanent attachment and no consideration of replacement.

Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

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5.1.2 Field strength of fundamental and harmonics

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.249(a) (d) (e)
Basic standard	: ANSI C63.10: 2013
Limits	: FCC Part 15.249(a) (d) (e) & 15.209(a)
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 2022-06-10 to 2022-06-14
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Ambient temperature	: 25.4 °C
Relative humidity	: 53 %
Atmospheric pressure	: 101 kPa

Note: Testing was carried out within frequency range 9kHz to the tenth harmonics. Only the worst case spurious emissions configuration of the each mode were reported.

For the measurement records, refer to the appendix B.

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5.1.3 20dB and 99% Bandwidth

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.215
Basic standard	: ANSI C63.10: 2013
Limits	: Within assigned band
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2022-06-10
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Ambient temperature	: 25.4 °C
Relative humidity	: 53 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

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5.1.4 Band Edge

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.249(a) (d) (e) & 15.209 & 15.205
Basic standard	: ANSI C63.10: 2013
Limits	: FCC Part 15.249(a) (d) (e) & 15.209 & 15.205
Kind of test site	: 3m Semi-anechoic Chamber

Test Setup

Date of testing	: 2022-06-10
Input voltage	: AC 120V, 60Hz
Operation mode	: A
Ambient temperature	: 25.4 °C
Relative humidity	: 53 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

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5.1.5 Conducted Emission on AC Mains

RESULT:**Pass****Test Specification**

Test standard	: FCC Part 15.207(a)
Basic standard	: ANSI C63.10: 2013
Frequency range	: 0.15 – 30MHz
Limits	: FCC Part 15.207(a)
Kind of test site	: Shielded Room

Test Setup

Date of testing	: 2022-06-14
Input voltage	: AC 120V, 60Hz
Operation mode	: B
Earthing	: Not connected
Ambient temperature	: 25.4 °C
Relative humidity	: 52.4 %
Atmospheric pressure	: 101 kPa

For the measurement records, refer to the appendix B.

6 Photographs of the Test Set-Up

For photographs of the test set-up, refer to the appendix A.

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